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10/820,633	04/08/2004	Robin Pierce Gardner	5051-631XX	8469

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EXAMINER	
HANNAHER, CONSTANTINE	

ART UNIT	PAPER NUMBER
2884	

DATE MAILED: 03/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/820,633	GARDNER, ROBIN PIERCE	
	Examiner	Art Unit	
	Constantine Hannaher	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-23 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 08 April 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date multiple (4).
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. As set forth in MPEP § 609:

> 37 CFR 1.98(b) requires that each item of information in an IDS be identified properly. U.S. patents must be identified by the inventor, patent number, and issue date. U.S. patent application publications must be identified by the applicant, patent application publication number, and publication date. U.S. applications must be identified by the inventor, the eight digit application number (the two digit series code and the six digit serial number), and the filing date. If a U.S. application being listed in an IDS has been issued as a patent, the applicant should list the patent in the IDS instead of the application. Each foreign patent or published foreign patent application must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication must be identified by publisher, author (if any), title, relevant pages of the publication, date and place of publication. The date of publication supplied must include at least the month and year of publication, except that the year of publication (without the month) will be accepted if the applicant points out in the information disclosure statement that the year of publication is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the particular month of publication is not in issue. The place of publication refers to the name of the journal, magazine, or other publication in which the information being submitted was published.

The information disclosure statement filed September 24, 2004 does not identify the inventor of the listed U.S. application.

The statement in the information disclosure statement filed March 21, 2005 would not qualify under 37 CFR 1.97(e) because it is not of the form required by the rule and each item of information listed is plainly not first cited as required. Because the statement qualifies under 37 CFR 1.97(b) the issue is moot.

The statement in the information disclosure statement filed May 31, 2005 would not qualify under 37 CFR 1.97(e) because it is not of the form required by the rule and each item of information listed is plainly not first cited as required. Also note that the patent number for Bonner *et al.* is misstated. Because the statement qualifies under 37 CFR 1.97(b) the issue is moot.

Evidence of consideration is not repeated.

Specification

2. The disclosure is objected to because of the following informalities: paragraph [0088], "22 Kg" should appear as --22 kg--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the signal processor" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 1 establishes only a coincidence module.

Claim 9 recites the limitation "the processor" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 1 establishes only a coincidence module.

The balance of the claims is rejected on the basis of their dependence.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-8, 11, 13-19, and 22 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Wormald (US004841153A).

With respect to independent claim 1, Wormald shows an assembly (Fig. **1**) for detecting gamma rays **11, 12, 13** from a bulk material **3** in a radiation region comprising a radiation source **1** configured to irradiate **2** the bulk material in the radiation region, a first gamma ray detector **5** positioned adjacent the radiation region and configured as recited (column 5, lines 45-47), a second gamma ray detector **6** positioned adjacent the first detector **5** and configured as recited (column 8, lines 33-37), and a coincidence module (analysis circuit **20** or Fig. **4**) configured as recited (column 5, lines 2-4).

With respect to dependent claim 2, the second gamma ray detector **6** in the assembly of Wormald comprises an array of gamma ray detectors configured as recited (column 5, lines 58-60 or Fig. **3**).

With respect to dependent claim 3, the assembly of Wormald further comprises a first photomultiplier tube **8** in communication with the first gamma ray detector **5** and a second photomultiplier tube **9** in communication with the second gamma ray detector **6**.

With respect to dependent claim 4, the analysis circuit **20** in the assembly of Wormald is configured as recited in view of Fig. **2**.

With respect to dependent claim 5, the coincidence counting rate shown in Fig. **2** of Wormald is the total rate of coincidence between the first and second gamma ray detectors.

With respect to dependent claim 6, the analysis circuit (Fig. **4**) in the assembly of Wormald is configured to select a subset of the events from one of the first and second detectors (those events which occur in the scintillators **20**, representing the activity of the second gamma ray detector, aligned as a pair) and to identify gamma ray events in the other of the first and second detectors (those events which occur in the scintillator **20** identified as central and representing the activity of the first gamma ray detector) in coincidence with the selected subset (column 8, lines 9-13).

With respect to dependent claim 7, the coincidence counting rate shown in Fig. **2** of Wormald is the rate of coincidence between a first event and a second event, wherein the first event and the second event sum to a predetermined energy (where the coincidence rate measured at E_4 is between an event in scintillator **A** and an event in one of the pairs of scintillators adjacent to **A** and the events sum to an energy predetermined by the energy of the incident gamma ray and the value 1.022 MeV, column 7, lines 41-59).

With respect to dependent claim 8, the predetermined energy in the assembly of Wormald is in the claimed range because the sum of an incident gamma ray energy of greater than 1.022 MeV (column 8, lines 41-43) and the value of 1.022 MeV (column 7, lines 57-59) establishes a range of 2.044 MeV and greater.

With respect to dependent claim 11, the assembly of Wormald further comprises a conveyor belt configured as recited (column 5, lines 41-42).

With respect to independent claim 13, Wormald discloses a method corresponding to the illustrated assembly (Fig. **1**) of detecting coincidence in gamma ray detectors for analyzing a bulk material **3** which would comprise the steps of providing the bulk material **3** in a radiation region, irradiating **2** the bulk material in the radiation region with a radiation source **5** adjacent the radiation region, detecting gamma ray events with a first gamma ray detector **5** adjacent the radiation region as recited (column 5, lines 45-47), detecting gamma ray events with a second gamma ray detector **6** adjacent the first detector **5** as recited (column 8, lines 33-37), and identifying gamma ray events that are detected in coincidence (using analysis circuit **20** or that of Fig. **4**) as recited (column 5, lines 2-4).

With respect to dependent claim 14, the second gamma ray detector **6** in the method of Wormald comprises an array of gamma ray detectors configured as recited (column 5, lines 58-60 or Fig. **3**).

With respect to dependent claim 15, the identification of gamma ray events in the method of Wormald is as recited in view of Fig. **2**.

With respect to dependent claim 16, the coincidence counting rate shown in Fig. **2** of Wormald is the total rate of coincidence between the first and second gamma ray detectors.

With respect to dependent claim 17, the determination of the coincidence counting rate in the method of Wormald comprises selecting a subset of the events from one of the first and second detectors (those events which occur in the scintillators **20**, representing the activity of the second gamma ray detector, aligned as a pair) and identifying gamma ray events in the other of the first and second detectors (those events which occur in the scintillator **20** identified as central and representing the activity of the first gamma ray detector) in coincidence with the selected subset (column 8, lines 9-13).

With respect to dependent claim 18, the coincidence counting rate shown in Fig. **2** of Wormald is the rate of coincidence between a first event and a second event, wherein the first event and the second event sum to a predetermined energy (where the coincidence rate measured at E_4 is between an event in scintillator **A** and an event in one of the pairs of scintillators adjacent to **A** and the events sum to an energy predetermined by the energy of the incident gamma ray and the value 1.022 MeV, column 7, lines 41-59).

With respect to dependent claim 19, the predetermined energy in the method of Wormald is in the claimed range because the sum of an incident gamma ray energy of greater than 1.022 MeV

(column 8, lines 41-43) and the value of 1.022 MeV (column 7, lines 57-59) establishes a range of 2.044 MeV and greater.

With respect to dependent claim 22, the providing of the bulk material in the method of Wormald includes transporting the bulk material **3** through the radiation region using a conveyor belt (column 5, lines 41-42).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 9, 10, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wormald (US004841153A) in view of Laney (US003626187A).

With respect to dependent claim 9, the analysis circuit **20** in the assembly of Wormald is configured to generate a one-dimensional plot (Fig. **2**) based on the signals from one of the gamma ray detectors. Laney shows that in an assembly with a first detector and a second detector operating in coincidence (Fig. **17**) that a one-dimensional plot relating the signals of the first and second detectors to the coincidence count rate (Fig. **1**) is inadequate, and that the generation of a two-dimensional plot based on the signals from the first and second detectors (*e.g.*, Fig. **5**) is superior for discriminating signal and noise (column 8, lines 64-67). In view of the improved analytical approach to accepting and rejecting coincident signals as represented by the additional views in Laney, it would have been obvious to one of ordinary skill in art at the time the invention was made to modify the assembly of Wormald such that the analysis circuit **20** was configured to generate a

two-dimensional plot of the type described by Laney (column 8, lines 7-9) based on the signals from the first and second gamma ray detectors **5**, **6**.

With respect to dependent claim 10, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a one-dimensional plot such as that shown by Laney (Fig. **1**) would be generated based on the two-dimensional plot by its establishment of an acceptance criterion (*e.g.*, Fig. **9**) since the overall system (Fig. **17**) still counts the sum of coincident pulses meeting the acceptance criterion (column 15, line 58 to column 16, line 12) and the sum-coincidence plot is a part of the conventional summation system modified only by the establishment of the acceptance criterion. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the assembly suggested by Wormald and Laney such that one-dimensional diagonal summation plots (representing the contents of the diagonal summations enclosed by the acceptance criterion) were generated based on the two-dimensional plot since such a one-dimensional plot is familiar to users of coincidence equipment.

With respect to dependent claim 20, the analysis circuit **20** in the method of Wormald generates a one-dimensional plot (Fig. **2**) based on the signals from one of the gamma ray detectors. Laney shows that in a method with a first detector and a second detector operating in coincidence (Fig. **17**) that a one-dimensional plot relating the signals of the first and second detectors to the coincidence count rate (Fig. **1**) is inadequate, and that the generation of a two-dimensional plot based on the signals from the first and second detectors (*e.g.*, Fig. **5**) is superior for discriminating signal and noise (column 8, lines 64-67). In view of the improved analytical approach to accepting and rejecting coincident signals as represented by the additional views in Laney, it would have been obvious to one of ordinary skill in art at the time the invention was made to modify the method of Wormald such that the analysis circuit **20** was configured to generate a two-dimensional plot of the

type described by Laney (column 8, lines 7-9) based on the signals from the first and second gamma ray detectors **5**, **6**.

With respect to dependent claim 10, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a one-dimensional plot such as that shown by Laney (Fig. **1**) would be generated based on the two-dimensional plot by its establishment of an acceptance criterion (*e.g.*, Fig. **9**) since the overall system (Fig. **17**) still counts the sum of coincident pulses meeting the acceptance criterion (column 15, line 58 to column 16, line 12) and the sum-coincidence plot is a part of the conventional summation system modified only by the establishment of the acceptance criterion. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method suggested by Wormald and Laney such that one-dimensional diagonal summation plots (representing the contents of the diagonal summations enclosed by the acceptance criterion) were generated based on the two-dimensional plot since such a one-dimensional plot is familiar to users of coincidence equipment.

9. Claims 12 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wormald (US004841153A) in view of Atwell.

With respect to dependent claim 12, Wormald describes the bulk material **3** moving along a conveyor (column 5, lines 41-42) but not through a chute. Atwell *et al.* shows (Fig. **1**) that in an assembly for detecting gamma rays from a bulk material **16** (column 5, lines 38-44) a chute **12** configured to transport the bulk material through the radiation region established by sources **22** is known. Since Atwell *et al.* discloses that a conveyor and a chute are known alternatives for moving bulk material through an assembly (column 2, lines 36-39) it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the assembly of Wormald such

that it further comprised a chute configured as shown in Atwell *et al.* An express suggestion to substitute one equivalent component for another is not necessary to render the substitution obvious.

With respect to dependent claim 23, Wormald describes providing the bulk material **3** as including transporting the bulk material using a conveyor (column 5, lines 41-42) but not passing the bulk material using a chute. Atwell *et al.* shows in a method corresponding to the illustrated assembly (Fig. **1**) for detecting gamma rays from a bulk material **16** (column 5, lines 38-44) that providing the bulk material by passing the bulk material through the radiation region established by sources **22** using a chute **12** is known. Since Atwell *et al.* discloses that using a conveyor and using a chute are known alternatives for providing bulk material through the radiation region (column 2, lines 36-39) it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Wormald such that it further comprised passing the bulk material **3** using a chute as shown in Atwell *et al.* An express suggestion to substitute one equivalent process for another is not necessary to render the substitution obvious.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (571) 272-2437. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov/. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ch

Constantine Hannaher
Primary Examiner